# California Energy Commission Research and Development for Transportation


## Natural Gas Vehicle Technology Forum

October 15 - 16, 2014

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# Policy Drivers

The following legislation and policy guide the ERDD Transportation subject area on meeting California's challenges:

**Senate Bill 1250:** *Enabled PIER funds to be used for advanced transportation technologies that:*

- *Reduce air pollution and GHG emissions beyond applicable standards.*
- *Benefit electricity and natural gas ratepayers.*

**State Alternative Fuels Plan:** *Presents strategies and actions California must take to increase the use of alternative transportation fuels.*

**ZEV Mandate:** *Requiring automakers to produce a combination of zero emission and partial zero emission vehicles to meet air quality goals.*

**Assembly Bill 32:** *Calls for approximately 36% of the state's 2020 GHG reduction targets to come from the transportation sector.*

# Goals

**The goals of transportation-related projects are to:**

- *Reduce carbon emissions*
- *Decrease reliance on fossil fuels*
- *Improve infrastructure capacity, reliability, and sustainability*
- *Improve air quality*
- *Increase the use of transportation renewable fuels*

# Research Topic Areas

**Transportation Topic Areas include:**

- Plug-In Electric Vehicles
- Natural Gas Vehicles
- Vehicle Energy Efficiency
- Renewable Transportation Fuel**

*** Transportation fuels research limited to Renewable Natural Gas*

# General Approach

**Electric Drive:** Facilitate the success of plug-in electric vehicles in the market, as well as determining their potential as a strategic technology to improve the operation of California's future power grid.

**Natural Gas Vehicles:** Advance the commercial viability of advanced and high-efficient natural gas vehicle technology. Research Roadmap recommended RD&D initiatives include:

- *Engine Development and Vehicle Integration*
- *Fueling Infrastructure and On-board Storage*
- *Technical and Strategic Studies*

**Renewable Transportation Fuel:** Develop and demonstrate innovative technologies that utilize California's waste streams to produce renewable natural gas.

# R&D Initiatives

| Research Topic | Initiative | Projects |
|---|---|---|
| • Plug-In Electric Vehicles | • Vehicle to Grid (V2G)<br>• Battery Recycle<br>• Battery Standardization | • CTC (LA AFB) - Vehicle to grid testing and demonstration with Department of Defense<br>• Farasis Energy – advanced battery recycling process for vehicle Li-ion batteries<br>• Electricore –Techno/Economic analysis for cost-benefits of battery standardization for PEVs |
| • Natural Gas Vehicle | • Engine Development<br>• Chassis Integration<br>• Vehicle Demonstration<br>• Advanced Hybridization<br>• On-Board Storage | • Co-funded with SCAQMD for NG Engine Development of low NOx, CWI 8.9L and Cummins15L<br>• New CWI 6.7L Spark Ignited Stoichiometric NG Engine<br>• NG Hybridization - Class 4 to 8 vehicles with Transpower, Efficient Drivetrains Inc., and GTI/US Hybrid<br>• Advanced NG adsorption on-board storage tank technology for light-duty vehicles with BlackPak, Inc. |

# R&D Initiatives Continued

| Research Topic | Initiative | Projects |
|---|---|---|
| • Renewable Transportation Fuel | • Renewable Natural Gas Production<br>• Waste -to-energy technology<br>• Landfill gas purification | • RNG Production projects focusing on co-products and co-benefits<br>• Steam Hydrogasification technology development<br>• Landfill Gas production process for LNG Transportation Fuel |
| • Vehicle Energy Efficiency | • Advanced automotive HVAC<br>• Advanced efficient truck technologies and systems | • Completed Thermoelectric HVAC development and demonstration project (Ford and GM)<br>• Completed California Hybrid, Efficient, and Advanced Truck Research Center project with CALSTART |

# Current Natural Gas Solicitations

- **Title: :** Advanced Natural Gas Engine Ignition System Research (PON-14-501)
- **Research:** Research and Development to support advanced high-energy ignition systems capable of overcoming the challenges of igniting natural gas fuel under high boost pressure with heavy EGR for spark ignited Class 3-8 engines. Will support emission reduction, reduced fuel consumption and improved engine performance goals.
- **Funding Amount:** $2,250,000 ($750,000 max/project)
- **Timeline:**
  - Pre-Bid Workshop: October 27, 2014, 1 p.m.
  - Deadline to Submit Applications: December 1, 2014, 3 p.m.

# Current Natural Gas Solicitations

- **Title:** Infrastructure Improvement Research for Natural Gas Fueling Stations (PON-14-502)
- **Research:** Research and Development to support applied R&D of compressed natural gas (CNG) fueling station improvements that reduce fueling infrastructure equipment costs and maintenance, and increasing efficiency for example: fueling to a full fill capacity.
- **Funding Amount:** $800,000 ($400,000 max/project)
- **Timeline:**
  - Workshop: October 24, 2014, 10 a.m. (amended date)
  - Deadline to Submit Applications: November 26, 2014, 3 p.m.

# Thanks!

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